

# Bradley Kohler

B.ENG. MECHATRONICS ENGINEERING · 5 YEARS OF PROFESSIONAL WORK EXPERIENCE

Toronto, ON, Canada

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## Skills

### Programming Languages

BASH  
C/C++/C#  
Python  
Java  
HTML/CSS/JavaScript

### Machine Learning

PyTorch  
TensorFlow

### Microprocessor Firmware

STM32  
Nordic  
Qualcomm  
Simulink

### Operating Systems

Linux  
AndroidOS  
mbedOS  
ChibiOS  
FreeRTOS

### Hardware Design

Verilog HDL  
NI Multisim  
Eagle

### Systems Design

AutoCAD  
SolidWorks  
Maplesim

### Computer Mathematics

Maple18  
NumPy  
Eigen  
MATLAB

### Continuous Integration

Docker  
TravisCI  
CircleCI  
Jenkins  
Bamboo

## Work Experience

### STMicroelectronics (STM)

[Waterloo, Ontario](#)

WIRELESS SOFTWARE DEVELOPER

Sept. 2021 - Present

- Added new release (36.331 specification V14, 15, 16, and 17) features to the Radio Resource Controller (RRC) layer of an LTE NB-IoT & MTC stack.
- Directed debugging efforts and coordinated communication with stack teams including L1, PDCP, RLC, MAC, and NAS.
- Interpreted 3GPP LTE specifications and translated them to embedded C, leveraging expertise in software architecture for seamless integration.
- Diagnosed and resolved stack issues using Amarisoft and Rohde & Schwarz CMW wireless communication conformance testing equipment.
- Authored innovative tools, such as a Python tool named asngen, which generated a lightweight C translation layer from the 36.331 specification to replace the existing encoder/decoders. It enabled a decrease of read-only data by 148KB (48%) compared to the existing implementation.
- Built and maintained lab machines equip with FPGAs, ASICs, Amarisoft, and Rohde & Schwarz equipment, ensuring a robust test environment.
- Assisted the ZigBee, Thread, and BLE Application teams in developing quality customer apps, demonstrating teamwork and customer focus.
- Communicated effectively with stack teams, including ZigBee APS, ZigBee NWK, and MAC 802.15.4, to aid in debugging efforts.

### Labforce Inc.

[Waterloo, Ontario](#)

CAMERA SOFTWARE & EMBEDDED FIRMWARE DEVELOPER

May 2020 - Sept. 2021

- Programmed neural network model structures in PyTorch using publications for reference, demonstrating research and implementation skills.
- Trained models for object detection in Python/PyTorch, such as Resnet-18, Resnet-50, and EfficientDet, using both public and private datasets.
- Created private datasets for training models for object detection, showcasing initiative and data management skills.
- Designed and programmed innovative approaches to object re-identification and tracking in C/C++ and Python, achieving fast results.
- Improved inertial sensor code bases in C/C++ and managed sensor processes as Unix systemd daemons on stereo cameras.
- Collaborated with another software developer to create a reliable C/C++ state estimation engine for stereo camera tracking, demonstrating teamwork and technical collaboration. The product was presented to the Royal Canadian Air Force (posted on YouTube).
- Worked with another software developer to create robust C/C++ camera calibration and simulation software.

### Northern Digital Inc.

[Waterloo, Ontario](#)

INTERN ADVANCED RESEARCHER & EMBEDDED FIRMWARE DEVELOPER

May 2018 - Sept. 2019

- Developed and programmed an embedded handheld device with multiple sensors to fuse with Polaris Vega infrared camera tracking data, showcasing innovation and technical skills.
- Collaborated with a Masters researcher to develop various data fusion algorithms (Vector, Quaternion, Pose estimation) in C++ and Python.
- Worked with another software developer to create a fast C/C++ sensor data simulation software.
- Partnered with another software developer to create a C/C++ and Python graphical viewer of real data (replayed) and simulated data.
- Developed low-level firmware drivers for virtual reality hand remotes including IMUs, ADCs, DACs, FLASH, UART, etc.

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## Education

### McMaster University

[Hamilton, Ontario](#)

MECHATRONICS ENGINEERING CO-OP

Sept. 2014 - April 2020

- McMaster Cumulative Grade Point Average 3.7/4.0
- McMaster Engineering Co-op Student of the Year Nominee

## Projects

### Neural Network Log Analysis

[Waterloo, Ontario](#)

RESEARCHER & DEVELOPER

October 2022 - May 2023

- Developed several neural network models alongside a PhD graduate to detect anomalies in wireless air transmissions and stack procedures.
- Used models such as RNN, RNN Attention-Based, and Transformer to detect anomalies in the nightly runs.

### JobFunnel

[Waterloo, Ontario](#)

DEVELOPER

June - Sept. 2019

- Developed webcrawling application alongside other developers to help find and organize job postings with 1900+ stars on GitHub.
- Glassdoor and Indeed implemented CAPTCHAs shortly after the release.